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TRUSCON
FORMED STEEL LINTELS

No. A-633 • MARCH, 1949

The Truscon formed steel lintel has the following points of superiority over the ordinary hot rolled angle:

1. Superior appearance of joint "A", Fig. 1, between outer flange of lintel and brick, over the open joint "B", Fig. 2, as shown in diagrams.

PATENT OFFICE
JUN 29 1949
DESIGN DIVISION

2. Mortar bed "C", Fig. 3, can be laid across formed lintel with no danger of loss at point "D". Note loss at point "D" in Fig. 4.

3. Brick placed on outer flange "E", Fig. 5, and pushed back toward vertex of angle, Fig. 6, will form its own mortar bed at both "F" and "G" also without loss of mortar.

4. Hot rolled lintel provides no mortar bed at point "H", Fig. 7, unless brick is chipped as shown at "I", Fig. 8.

5. Rib "J", Fig. 9, provides barrier causing water to drop off at this point instead of running toward the vertex and thence down the face of the opening as at "K", Fig. 10. Capillary action will draw the water along a level surface but it will not draw it up hill into groove "J", Fig. 9.

6. Most hot rolled lintels are provided with an inferior prime coat of paint applied over a dirty rusty surface. This prime coat will often deteriorate quickly or flake off thereby nullifying the

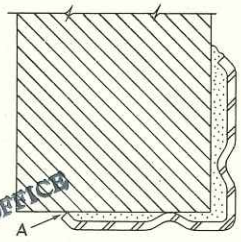

Fig. 1

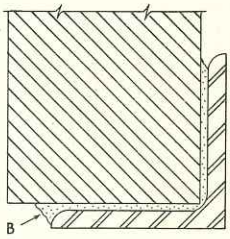

Fig. 2

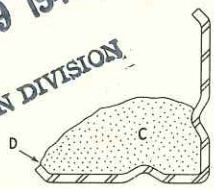

Fig. 3

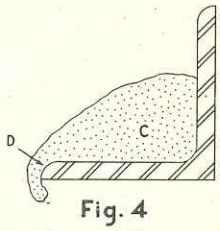

Fig. 4

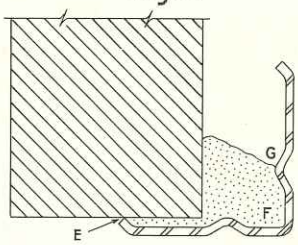

Fig. 5

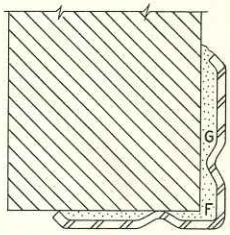

Fig. 6

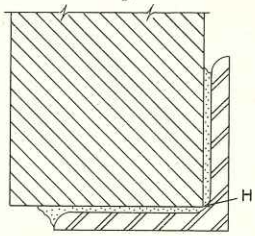

Fig. 7

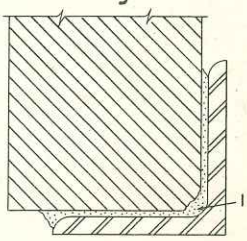

Fig. 8

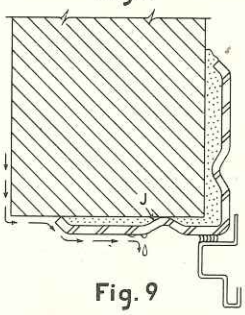

Fig. 9

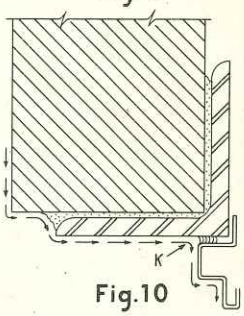

Fig. 10

value of subsequent coats of finish paint that may be applied. As a chain is no stronger than its weakest link, so the value of a protective surface consisting of numerous coats of paint is in proportion to the adherence of the prime coat.

Truscon formed steel lintels are bonderized and painted with a high grade enamel which is baked on at 300 degrees F. As you know the bonderizing process includes thorough cleaning of the surface and subsequent application of a phosphate coating which provides an excellent base for paint. This is the same process that is used in most major automobile factories to prepare steel for acceptance of paint.

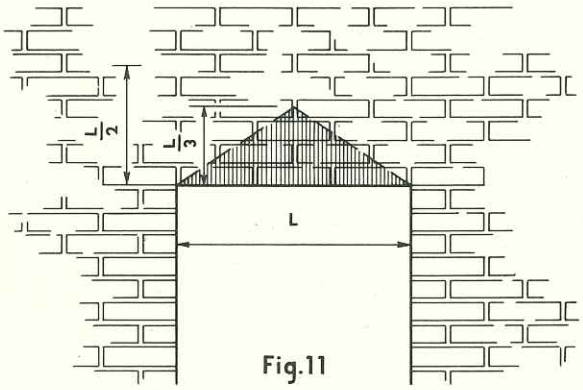

Fig.11

7. Formed steel lintels provide ample strength. For, example, let us compute the load that must be carried by a 4'-6" Formed Steel Lintel used in brick veneer construction over a type 3445 Double-Hung Window. The masonry opening would be 3'-4½" so that the lintel would have an end bearing of 6¾" at either jamb.

One important factor to remember, when considering weight to be carried by a lintel, is that the load will be less if the height of the brick work over the lintel is equal to more than one-half the width of the opening, than it will be if the height is equal to less than one-half the opening. This apparent contradiction is explained thus.

When the height of the brick work, directly over the lintel, equals or exceeds one-half the width of the opening $\left(\frac{L}{2}\right)$ it is assumed, in engineering practice, that only the triangular portion of the wall, shown shaded in Fig. 11, at left, is carried by the lintel while the balance of the wall arches directly to the supports at the jamb. The height $\left(\frac{L}{3}\right)$ of the apex of this triangular portion of the wall that would then be carried by the lintel is equal to 1/3 of the clear span (L) of the lintel or in this case 1'-1½".

When the height of the brick work, over the lintel, is equal to less than one-half the width of the opening, no arching is considered as taking place and the entire weight of such brick work, plus any load superimposed upon the brick work, must be carried by the lintel.

Reduced to the example described above we find

a. Weight carried by lintel when brick work exceeds one-half the width of opening:

   Area of triangular portion — 1'-8¼" x 1'-1½" = 1.9 sq. ft.

   1.9 sq. ft. of wall @ 40# per sq. ft. = 76 lbs. carried by lintel

b. Weight carried by lintel when height of brick work is ½" less than one-half the width of opening:

   Area of wall = 3'-4½" x 1'-8¼" = 5.7 sq. ft.

   5.7 sq. ft. of wall @ 40# per sq. ft. = *228 lbs. carried by lintel.

   This, however, would be the maximum load that could be caused by the weight of the wall itself.

   *To this must be added any superimposed weight.

NOTE: If the wall carries any load in addition to its own weight, or if material heavier than brick is used, care should be taken to compute the actual load where the height of the wall above the lintel does not exceed one-half the opening width. This is also true if any load bearing members frame into the wall at a point above the lintel not equal to one-half the opening width.

When the height of the brick work directly over a lintel equals or exceeds one-half the width of the opening, any load in excess of the weight of the masonry in the triangle, noted in Fig. 11, will arch to the supports at the jamb and therefore the lintel provides a far greater than 5 to 1 factor of safety.

The only condition where caution must be used and the load checked, by an engineer, is when lintels are used in a load bearing wall where the unbroken height of the brick wall does not equal or exceed one-half the width of the opening.

8. Industrial engineers are realizing more and more that a tired workman cannot produce nearly as much work or as good work. A 3 x 3 x ¼ hot rolled angle 4'-6" long weighs approximately 22#. The formed steel lintel of the same length weighing only 13# is obviously easier to handle and will not fatigue the mason.

9. Because second hand angles have sometimes been cut up and re-used as lintels, many builders and dealers might jump to the conclusion that a formed steel lintel made from prime sheet stock, bonderized and provided with a baked on prime coat of paint, could not possibly compete. Our investigations have proved conclusively that not more than 5% of the lintels used in new residential construction are made from second hand materials.

Even in highly competitive districts such as New York, Washington and Detroit, we have found that our published prices on formed lintels are competitive with new hot rolled angles. Therefore, we are safe in saying that all the advantages enumerated may be had at no increase in cost.

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SUMMARY OF SUPERIORITY OF FORMED STEEL LINTEL OVER HOT ROLLED ANGLE:

1. Improved appearance of exposed mortar joint.
2. No waste of mortar.
3. Better mortar base.
4. No chipping of brick.
5. Better drain for water.
6. Reliable prime coat of paint.
7. Strength enough to provide a sufficient factor of safety for all ordinary non-wall bearing brick construction.
8. Easier handling due to lighter weight.
9. All the above advantages at no increase in cost.

PATENT OFFICE
JUN 29 1949
DESIGN DIVISION

LOAD LIMITS FOR TRUSCON FORMED STEEL LINTELS USED OVER TRUSCON RESIDENTIAL WINDOWS

Window Type	Opening Width	Lintel Length	*Maximum Load	Load Limit
1 light Casement	1'-7⅜"	2'-6"	52 lbs.	2808 lbs.
2 light Casement	3'-1¼"	4'-0"	192 lbs.	1422 lbs.
3 light Casement	4'-5⅜"	5'-6"	397 lbs.	1936 lbs.
4 light Casement	5'-9⅝"	6'-6"	673 lbs.	1616 lbs.
2'-0" Double-Hung	2'-0½"	3'-0"	83 lbs.	1904 lbs.
2'-4" Double-Hung	2'-4½"	3'-6"	113 lbs.	1676 lbs.
2'-8" Double-Hung	2'-8½"	3'-6"	146 lbs.	1676 lbs.
3'-0" Double-Hung	3'-0½"	4'-0"	185 lbs.	1422 lbs.
3'-4" Double-Hung	3'-4½"	4'-6"	228 lbs.	1235 lbs.
3'-8" Double-Hung	3'-8½"	4'-6"	276 lbs.	1235 lbs.
15"x12", 15"x16", or 15"x20" two light Basement	2'-8½"	3'-6"	147 lbs.	1676 lbs.
Utility	2'-8½"	3'-6"	147 lbs.	1676 lbs.

*Maximum Load: This is the maximum weight of a brick wall that would have to be carried by the lintel, and is based upon the height of the brick work directly over the lintel being less than one-half the width of the opening.

PROPERTIES OF SECTIONS

3½" x 3½" x 11 Ga. @ 2.81# Per Ft.

AXIS X-X And Y-Y			
I	S	r	X or Y
.98	.39	1.08	.91

AXIS Z-Z
r
.67

STANDARD LENGTHS: 2'-6", 3'-0", 3'-6" 4'-0", 4'-6"

4½" x 3½" x 9 Ga. @ 4.04# Per Ft.

AXIS X-X				AXIS Y-Y				AXIS Z-Z
I	S	r	Y	I'	S'	r'	Y'	r
2.44	.78	1.44	1.31	1.30	.50	1.05	.81	.76

STANDARD LENGTHS: 5'-0", 5'-6", 6'-0", 6'-6", 7'-0".

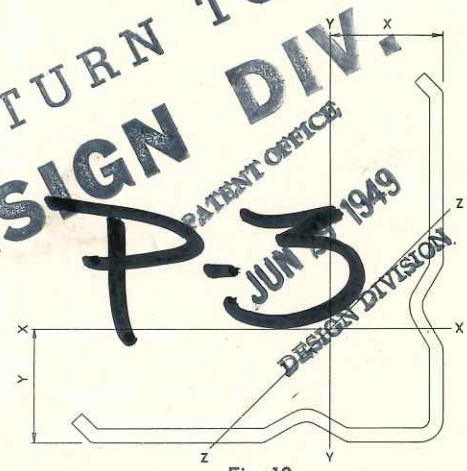

Fig. 12

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TRUSCON SALES OFFICES LOCATED IN THESE CITIES

ALBANY 7, N. Y.
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BIRMINGHAM 3, ALA.
*BOSTON 27 (South), MASS.
*BUFFALO 3, N. Y.
CHARLESTON, W. VA.
*CHATTANOOGA 1, TENN.
*CHICAGO 6, ILL.
*CINCINNATI 2, OHIO
*CLEVELAND 15, OHIO
COLUMBUS 15, OHIO
DALLAS 1, TEXAS
DAYTON 2, OHIO
*DENVER 2, COLO.
*DETROIT 26, MICH.
ERIE, PA.
GREENSBORO, N. C.
HARRISBURG, PA.
*HOUSTON 11, TEXAS
*INDIANAPOLIS 3, IND.
*JACKSONVILLE 2, FLA.
*KANSAS CITY 6, MO.
LITTLE ROCK, ARK.
*LOS ANGELES 54, CALIF.
LOUISVILLE 2, KY.
MEMPHIS 5, TENN.
MINNEAPOLIS 2, MINN.
NEW ORLEANS 12, LA.
*NEW YORK 17, N. Y.
NORFOLK 10, VA.
*OKLAHOMA CITY 2, OKLA.
OMAHA 2, NEB.
*PHILADELPHIA 3, PA.
PHOENIX, ARIZONA
*PITTSBURGH 22, PA.
*PORTLAND 12, ORE.
POTTSVILLE, PA.
RICHMOND, VA.
*ST. LOUIS 3, MO.
SALT LAKE CITY 10, UTAH
*SAN FRANCISCO 5, CALIF.
SEATTLE 4, WASH.
SYRACUSE 2, N. Y.
TOLEDO 4, OHIO
WASHINGTON 5, D. C.
*YOUNGSTOWN 1, OHIO

*Warehouses located in these districts

TRUSCON STEEL COMPANY

YOUNGSTOWN 1, OHIO

HOME OFFICE AND PLANT, YOUNGSTOWN 1, OHIO

Subsidiary of Republic Steel Corporation